BERNHARD J. VAN VONDEL

Natuurmuseum Rotterdam

REVISION OF THE PALAEARCTIC AND ORIENTAL SPECIES OF *PELTODYTES* RÉGIMBART (COLEOPTERA: HALIPLIDAE)

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The eight Palaearctic and Oriental species of the genus *Peltodytes* Régimbart are revised. *P. pekinensis* is described as new. Most primary types have been studied. *P. wui* Gschwendtner is considered a junior synonym of *P. coomani* Peschet. Lectotypes are designated for *P. coomani* Peschet, *P. intermedius* (Sharp), *P. variabilis* (Clark) and *P. wui* Gschwendtner. A key to the species is provided, as are distribution-maps.

B. J. van Vondel, Roestuin 78, 3343 CV Hendrik Ido Ambacht, The Netherlands.

Key words. – *Peltodytes*, palaearctic region, oriental region, new species.

Since Zimmermann (1924) published his key to the Haliplidae of the world, only little attention has been payed to the East Palaearctic and Oriental species of *Peltodytes*, with only four new species described since. Doubts about the status of these species warranted a revision. The type material of most nominal taxa was studied, but the identity of some others was sufficiently established. Unfortunately a few types could not be located.

Female genitalia are not described, because they usually appear very uniform. Further research is necessary to check if there are characters sufficiently reliable to separate the species.

MATERIAL

About 1700 specimens, including type-material were studied from the following collections:

British Museum (Natural History), London, UK (BMNH); B.P. Bishop Museum, Honolulu, Hawaii, USA (BPBM); Fries Natuurhistorisch Museum, Leeuwarden, Netherlands (FNML); IES Laboratory, Hebrew University of Jerusalem, Israel (HUJI); Institut Royal des Sciences Naturelles, Brussels, Belgium (ISNB); Muséum National d'Histoire Naturelle, Paris, France (MNHN); Museon, The Hague, Netherlands (MOG); Naturhistorisches Museum Wien, Vienna, Austria (NHMV); Natuurmuseum Rotterdam, Rotterdam, Netherlands (NHMZ); Oberösterreichisches Landesmuseum, Linz, Austria (OLML); Instituut voor Bos- en Natuuronderzoek (Rijksinstituut voor Natuurbeheer), Leersum, Netherlands (RIN); Nationaal Natuurhistorisch Museum (Rijks Museum van Natuurlijke Historie), Leiden, Netherlands (RMNH); Instituut voor Taxonomische Zoölogie (Zoologisch Museum), Amsterdam, Netherlands (ZMAN); Zoologiska Museet, Helsinki, Finland (ZMH); Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (ZMHB); Universitetets Zoologiske Museum, Copenhagen, Denmark (ZMUC); Zoologische Staatssammlung, Munich, Germany (ZSMC).

private collections:

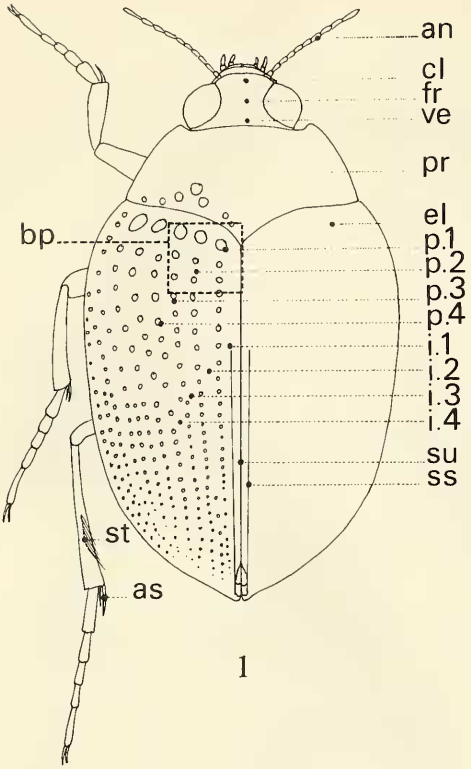
A. L. van Berge Henegouwen (Zoetermeer), J. G. M. Cuppen (Ede), M. B. P. Drost (Wadenoijen), Th. G. Giessen (Gaanderen), M. Hielkema (Gouda), J. Huijbregts (Leiden), Y. Jongema (Wageningen), P. Kanaar (Leiderdorp), N. Nieser (Tiel), J. C. P. M. van de Sande (Nijmegen), M. Schilthuizen (Leiden), M. Schreijer (Alkmaar), H. J. Vallenduuk (Boxtel), B. J. van Vondel (Hendrik Ido Ambacht), all in The Netherlands.

METHODS

Dissecting, preparing and drawing the aedaegi follows the methods described by Vondel (1991: 76). Morphological terms are exemplified in figs. 1 and 2.

The Palaearctic and Oriental regions are treated here together because some species are common to both regions. *Peltodytes* is not known from the Australasian region east of Sulawesi.

Locality-names are spelled, as far as possible, according to the Times Atlas of the World (Comprehensive edition, 1983), but when different from original labels, the modern name is given in parentheses. Names of countries are used with their present-day boundaries.



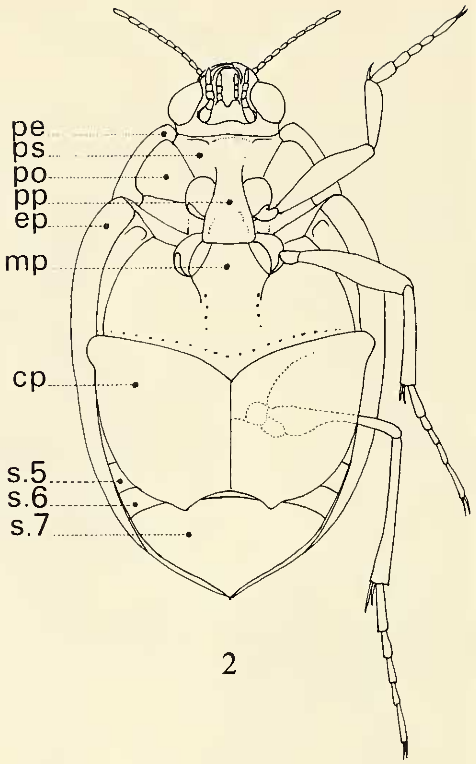


Fig. 1. *Peltodytes caesus*, dorsal view. – an, antenna; as, apical spur; bp, location of basal punctures, illustrated for each species; cl, clypeus; el, elytron; fr, frons; i.1, i.2, i.3, etc., first, second, third etc. interval; pr, pronotum; p.1, p.2, p.3, etc., first, second, third, etc puncture-row; ss, sutural stria; st, setiferous striole; su, suture; ve, vertex.

Fig. 2. *Peltodytes caesus*, ventral view. – cp, metacoxal plate; ep, elytral epipleuron; mp, metasternal process; pe, pronotal epipleuron; po, proepisternum; pp, prosternal process; ps, prosternum; s.5, fifth sternite; s.6, sixth sternite; s.7, seventh (last) sternite.

Distribution maps are based on material examined. Reliable literature records are included using different symbols.

Notes on the biology are mainly based on literature and the author's experience.

SYSTEMATIC SECTION

Genus *Peltodytes* Régimbart

Peltodytes Régimbart, 1878: 450. Type-species: *Dytiscus caesus* Duftschmid, 1805, by subsequent designation (Balfour-Browne 1936: 68).

Cnemidotus sensu Erichson, 1832: 48 (nec *Cnemidotus* Illiger, 1802: 373). [Type-species not validly fixed (Holmen, 1987: 86)].

Neopeltodytes Satô, 1963a: 21. Type-species: *Peltodytes callosus* (Leconte), by original designation [see note below].

Cnemidotus; Aubé 1836: 36, Seidlitz 1887: 35.

Peltodytes; Zimmermann 1920: 298, Zimmermann 1924: 6, Balfour-Browne 1936: 68, 1938: 5, 1940: 157, Guignot 1947: 34, Zaitsev 1953: 32, Satô 1963a: 21, 1963b: 23, Franciscolo 1979: 67, Holmen 1987: 86, Beutel & Ruhnau 1990: 4.

Remarks

Satô referred to the division of *Peltodytes* into two groups by Zimmermann (1924) and defined the subgenus *Neopeltodytes* by the absence of the posterior teeth on the metacoxal plates as present in the species of *Peltodytes* s. str. Zimmermann used another character: an in the middle impressed metasternal process in group I (=*Peltodytes* s. str. in Palaearctic, Ethiopean and Oriental regions) or a not impressed metasternal process in group II (=*Neopeltodytes*, in Nearctic and most northern part of Neotropical regions).

Assignment of *Peltodytes*-specimens to one of the subgenera meets some problems as there are Nearctic species having a weak tooth on the metacoxal plates or a more or less impressed metasternal process, while some Palaearctic species sometimes show hardly developed teeth on the metacoxal plates. A more extensive character-set is needed to support the subgeneric division.

The phylogenetic position of *Peltodytes* is discussed by Beutel & Ruhnau (1990).

The genus *Peltodytes* is represented in all faunal regions, excepting the Australasian and the Neotropical regions apart from Mexico and Cuba (Roberts 1913, Zimmermann 1924, Guignot 1959).

Differential diagnosis

The genus *Peltodytes* is defined by the following combination of characters:

Head: Labial and maxillar palpi with ultimate segment clearly longer than penultimate segment. Behind the eyes only one genal line (fig. 51).

Elytra: along suture a stria over at least posterior half. All puncture-rows relatively equal in strength, no weaker secondary puncture-rows present. If intermediate (secondary?) puncture-rows are present, these are restricted to apical part and about as strong as adjacent rows. Apical part of suture incised, exposing inner margin of suture.

Underside: Epipleura reaching last abdominal segment. Metacoxal plates reaching at least sixth sternite, laterally bordered to halfway posterior edge. Posterior edge of each plate produced into a strong tooth, except or hardly in nearctic species.

The wings were figured by Griffini (1897).

Sexual characters: Males have the first two tarsal segments of fore and midlegs widened and ventrally provided with sucker-hairs.

Within the Haliplidae *Peltodytes* can be recognized by means of the following key.

Key to the genera of Haliplidae:

1. Last segment of palpi longer than penultimate segment (fig. 6 and 7). Metacoxal plates at least covering part of sixth abdominal sternite (fig. 2) ....*Peltodytes* Régimbart
– Last segment of palpi clearly shorter than penultimate segment. Last three abdominal sternites freely visible. 2
2. Head as wide as pronotum. Elytra strongly punctured, not in rows. ....*Algophilus* Zimmermann
– Head not as wide as pronotum. Elytra with clear rows of punctures..3
3. Pronotum almost square, front-corners strongly rounded. Elytra with or without longitudinal ridges in first six intervals. ......*Brychius* Thomson
– Pronotum widest at base, sides converging anteriorly. Elytra without longitudinal ridges in first six intervals. ....*Haliplus* Latreille or ....*Apteraliplus* Chandler

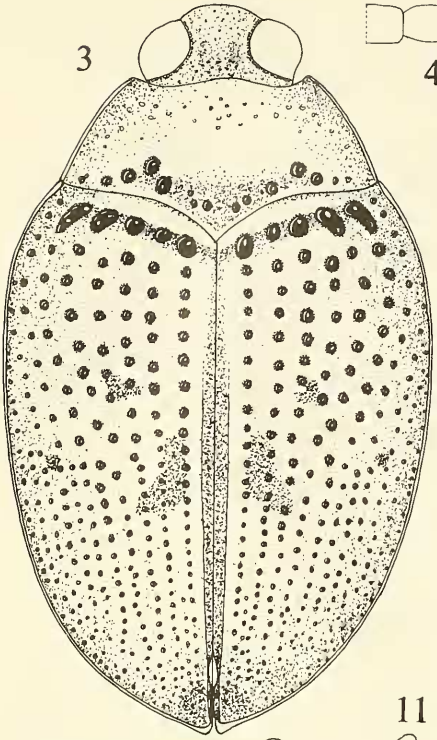
Note: *Algophilus* is restricted to Southern Africa. *Apteraliplus* is only known from North America with a single species: *Apteraliplus parvulus* (Roberts). The separate generic status of the latter is subject to further research.

Checklist of palaearctic and oriental *Peltodytes*

Peltodytes Régimbart, 1878
caesus (Duftschmid, 1805)
  ?*curculinus* (O. F. Müller, 1776)
  quadrimaculatus (Drapiez, 1820)
  caesus var. *levantinus* (Sahlberg, 1902a)
  delhermi (Mazéret, 1923)
  [*impressus* Fabricius sensu Panzer, 1794; nec Fabricius, 1787. Misidentification]
coomani Peschet, 1923
  wui Gschwendtner, 1934 **syn. n.**
dauricus Zimmermann, 1924
intermedius (Sharp, 1873)
rotundatus (Aubé, 1836)
  conifer (Seidlitz, 1887)
pekinensis **sp. n.**
sinensis (Hope, 1845)
  variabilis (Clark, 1863)
  koreanus Takizawa, 1931
sumatrensis Régimbart, 1885

Key to species

1. Margins of pronotum narrow, not thicker than antennae, hind corners hardly protruding (fig. 3) 2
- Margins of pronotum broad, clearly thicker than antennae, hind corners strongly protruding (fig. 16)..7
2. Hind margin of metacoxal plates with a weak blunt tooth (fig. 10)..3
- Hind margin of metacoxal plates with a sharp long tooth (fig. 43). 4
3. Fourth elytral puncture-row complete or at most slightly interrupted in the middle. Base of pronotum strongly impressed, in the impression a transverse row of strong darkened punctures. Not with basal marks on pronotum, larger than darkened punctures. Vertex at most with two vague marks (fig. 3). Males: surface of apical parts of parameres hairy (fig. 15) ....*P. caesus*
– Fourth elytral puncture-row only clearly present in basal part, represented by about 3-5 punctures. Base of pronotum hardly impressed, on both sides of impression two joined strong punctures and about three small ones, connected by a dark mark. Vertex with two small distinct marks (fig. 74). Males: surface of apical parts of parameres areolate (fig. 84)..................................*P. sinensis*
4. Antennae slender, segments longer than wide (fig. 28)..5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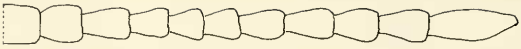
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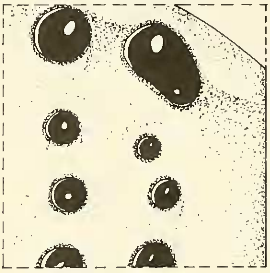
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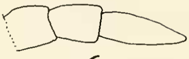
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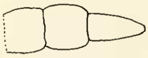
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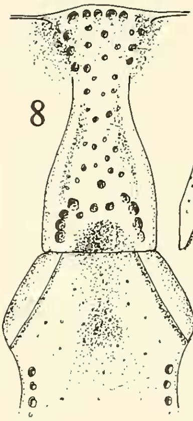
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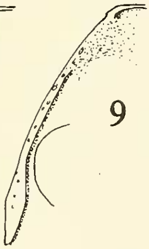
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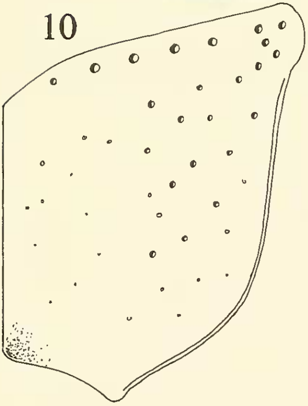
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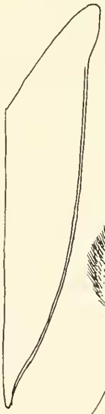
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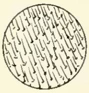
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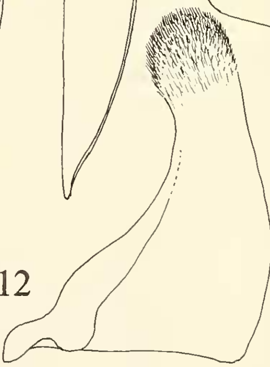
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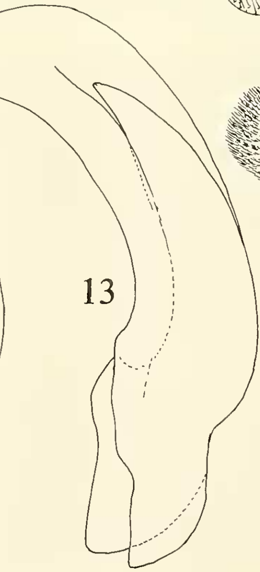
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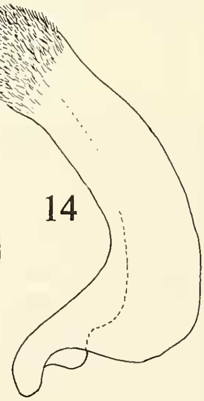
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- Antennae short, segments 2-9 about as long as wide (fig. 62). Males: surface of apical parts of parameres hairy (fig. 73). ....*P. rotundatus*

5. Punctures on elytral epipleura black. Prosternal process clearly bordered in anterior half (fig.41). Males: surface of apical parts of parameres areolate (fig. 48). 6

- Punctures on elytral epipleura not black. Prosternal process usually not completely and clearly bordered in anterior half (fig. 30). Surface of apical parts of parameres hairy (fig. 37).......... ....*P. dauricus*

6. Pronotum without black punctures in posterior corners between margin and widened basal punctures (fig. 49). Proepisternum without strong dark punctures, when very weak punctures present these are not darkened. Teeth of coxal plates usually long but with a blunt point, especially in lateral view (fig. 55 and 56). Head with a black collar behind eyes (fig. 51)......*P. pekinensis*

- Pronotum with black punctures in posterior corners between margin and widened basal punctures (fig. 38). Proepisternum with strong darkened punctures. Teeth of coxal plates long and sharp (fig. 43 and 44). Head without a black collar directly behind eyes.................*P. intermedius*

7. Elytra with large dark marks and usually with black band connecting basal punctures. Two clear sharp dark spots on vertex (fig. 85). ....*P. sumatrensis*

- Elytra with at most a few small marks and base usually not black. Vertex with at most two vague spots (fig. 16).................................. *P. coomani*

DESCRIPTION OF SPECIES

Peltodytes caesus (Duftschmid)

(figs. 3-15)

?*Dytiscus curculinus* O. F. Müller, 1776: 73. Syntypes: [Denmark or Norway]. [probably destroyed].
Dytiscus caesus Duftschmid, 1805: 284. Syntypes: Austria. Typematerial probably in OLML [not examined].
Haliplus quadrimaculatus Drapiez, 1820: 349. Location of types unknown [not examined].
Cnemidotus caesus var. *levantinus* Sahlberg, 1902-1903a: 17. Syntypes: 1 ex., Israel, Jaffa, J. Sahlberg; 6 ex., Greece, Corfu, J. Sahlberg (ZMH)(Biström 1987: 33) [not examined].
Cnemidotus delhermi Mazéret, 1923: 67. Syntypes: France, Armagnac, étangs à Espas, L. Mazéret. Location of types unknown [not examined].
[*Dytiscus impressus* sensu Panzer 1794: t. 7. nec Fabricius, 1787. [Misidentification]. Lectotype ♀ of *D. impressus* Fabricius, which is identical to *Haliplus ruficollis* (De Geer, 1774) was designated by Holmen (1987: 133)].
Peltodytes curculinus; Zimmermann 1920: 299, 1924: 7.
Cnemidotus impressus; Seidlitz 1887: 35.
Peltodytes impressus; Zimmermann 1920: 299, 1924: 7.
Dytiscus caesus; Erichson 1832: 48.
Peltodytes quadrimaculatus; Zimmermann 1920: 299, 1924: 7.
Haliplus caesus; Gyllenhal 1827: 234.
Cnemidotus caesus; Aubé 1836: 38, Régimbart 1877: 354, Seidlitz 1887: 35.
Peltodytes caesus; Bedel 1881: 223, Escalera 1914: 56, Zimmermann 1920: 299, 1924: 7, Balfour-Browne 1940: 157, Csiki 1946: 571, Guignot 1947: 36, 1959: 21, Lagar Mascaro 1951: 76, Zaitsev 1953: 34, Freude 1971: 9, Hosseinie 1974: 242, 1978: 167, Ienistea 1974: 204, Minoransky & Dzumailo 1974: 26, Ali 1976: 91, Galewski 1976: 8, Konev 1976: 56, Mateleshko 1977: 68, Franciscolo 1979: 70, Guéorguiev 1958: 44, 1963: 215, 1981: 399, Foster 1981: 4, Angelini 1984: 48, Holmen 1987: 88, Zakharenko & Moroz 1988: 282, Belyashevskiy 1989: 124, Leblanc 1990: 1.C.3.
Cnemidotus caesus var. *levantinus*; Sahlberg 1902-1903b: 6.
Peltodytes caesus var. *levantinus*; Zimmermann 1920: 299, 1924: 7, Guignor 1959: 21, Zaitsev 1953: 35, Franciscolo 1979: 71.
Peltodytes caesus ssp. *levantinus*; Guéorguiev 1958: 44.

Remarks

P. caesus was described from Austria. Since no other species of *Peltodytes* are known from Austria, the description by Duftschmid leaves hardly any doubt about the identity of the species.

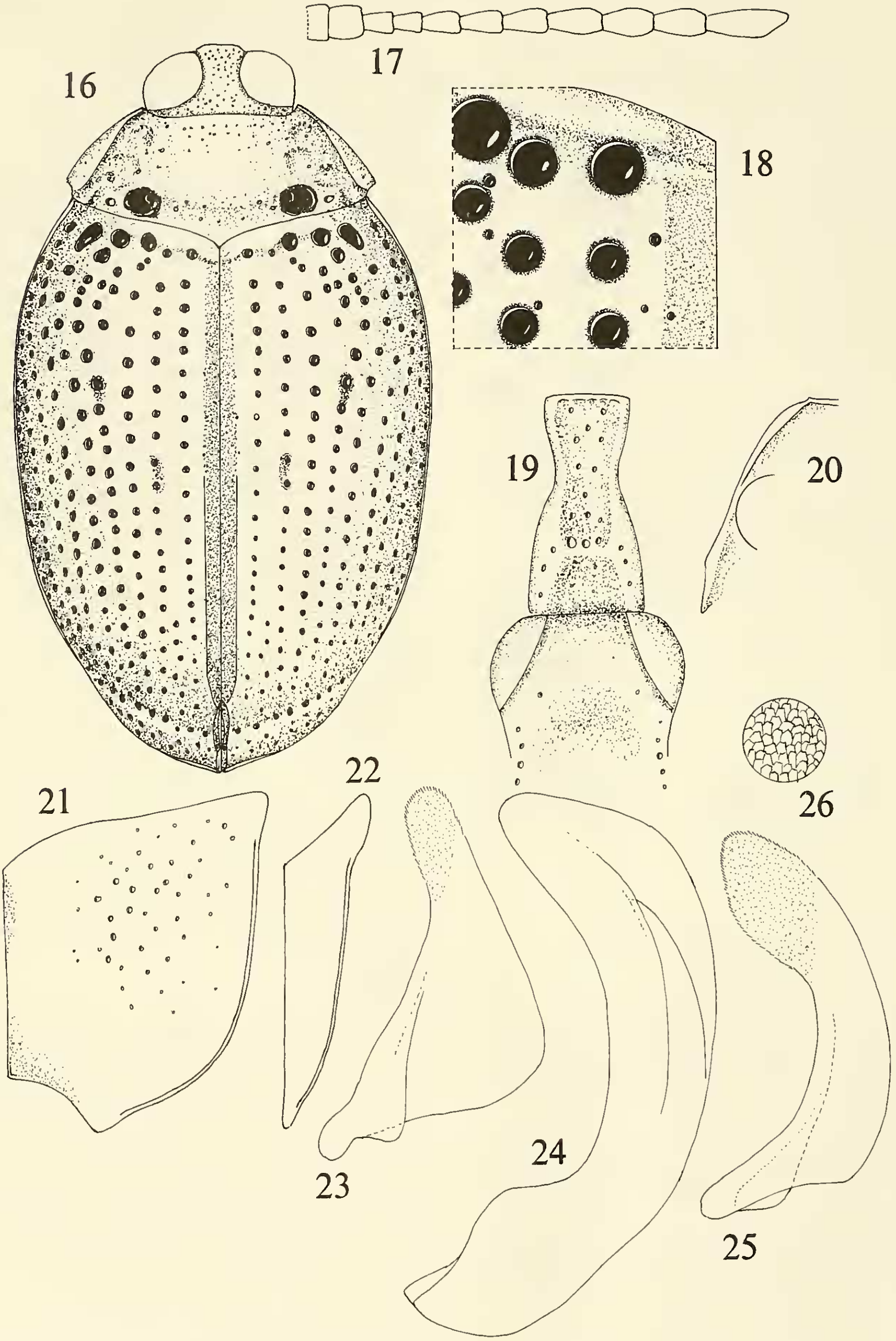
Schönherr (1808: 26) gives *Dytiscus curculinus* O. F. Müller as a synonym of *D. impressus* Fabricius, which is not conspecific with *P. caesus.* Zimmermann (1920) gives it again (with a questionmark) as a possible synonym of *P. caesus.* As Müllers' collection does not exist anymore it seems impossible to settle the identity of this name.

Description

Length 3.3-3.8 mm, width 1.7-2.0 mm. Body subparallel to parallel, widest in the middle (fig. 3).

Head: Yellow to brown, two large, sometimes vague, dark blotches between eyes, sometimes confluent with slight darkening on vertex. Moderately strongly and densely punctured, punctures on vertex darkened. Distance between eyes 0.9-1.0× width of one eye. Antennae yellow to yellow-red, segment 4-6 about as long as wide (fig. 4). Palpi yellow to yellow-red.

Figs. 3-15. *Peltodytes caesus*, Netherlands. – 3, dorsal view; 4, antenna; 5, punctures near elytral base and suture; 6, maxillair palpus; 7, labial palpus; 8, prosternal process; 9, lateral view of prosternal process; 10, metacoxal plate; 11, lateral view of metacoxal plate; 12, left paramere; 13, penis; 14, right paramere; 15, surface of apical part of parameres.



Figs. 16-26. *Peltodytes coomani*, lectotype. – 16, dorsal view; 17, antenna; 18, punctures near elytral base and suture; 19, prosternal process; 20, lateral view of prosternal process; 21, metacoxal plate; 22, lateral view of metacoxal plate; 23, left paramere; 24, penis; 25, right paramere; 26, surface of apical part of parameres.

Pronotum: Yellow. Along base a row of widened darkened punctures, of which strongest ones are opposite third elytral puncture-rows. Rest of pronotum with sparse uncoloured punctures. Base impressed. Lateral margin finer than antennae, not narrowed anteriorly, straight with convex anterior part.

Elytra: Yellow, darkened suture, discal, sometimes vague, mark not connected to suture, vague marks on intervals sometimes missing. Margined completely, posteriorly not clearly concave. Posterior part not bulbous, evenly rounded as rest of elytra. Punctures moderately strong, about 30 punctures in first row. Posteriorly about 6-15 punctures in second interval. Fourth row in middle not or over a distance of at most 5 punctures interrupted. Puncture-rows in seventh and ninth interval stretched out over about posterior half or even exceeding the middle. Basal punctures widened(fig. 5). All punctures darkened. Sutural striae stretched out over posterior 2/3.

Underside: Yellow to yellow-red, legs yellow to brown, darkened towards coxae. Epipleura with uncoloured punctures, reaching to 1/4 of last sternite. Prosternal process posteriorly grooved in the middle and with marginal plicae, strongly and coarsely punctured, anteriorly hardly margined (fig. 8 and 9). Metasternal process strongly grooved in the middle, hardly punctured, plicae along coxae (fig. 8). Metacoxal plates with a blunt tooth, just reaching last sternite, sparsely punctured (fig. 10 and 11). Last sternite unpunctured, strongly impressed in front corners. Setiferous striole on dorsal face of hind tibia about 1/3× length of tibia, longest of two tibial spurs 3/4× length of first tarsal segment.

Male: Penis and parameres as in figs. 12-14, surface of apical part of parameres hairy (fig.15).

Immature stages: Third stage larvae described by Schiødte (1872: 203).

Biology

In fresh or occasionally brackish stagnant water of ponds or ditches and slowly running streams. Among vegetation of *Ranunculus*, *Callitriche*, *Elodea*, *Chara* and other waterplants. Feeding on filamentous algae and probably Characeans. The eggs are laid on the surface of waterplants. The adults are attracted to light (Konev 1976 and pers. obs.).

Distribution (fig. 96)

Europe northward to southern England, Denmark and southern Sweden, eastward to Belorussia and the Ukraine, southward to Portugal, Spain, Italy and Greece. Asia: Turkey, Kazakhstan, southern part of the Russian Federation, Afghanistan, Iran, Syria, Israel. Africa: Morocco. Ali (1976) records a *Peltodytes* sp. from Irak. It probably concerns *P. caesus*.

Material examined. – Albania: 2 ex. (NHMV) • Austria: 76 ex. (NHMV, RMNH, ZMAN) • Belgium: 1 ex. (Lodewijcks).- Czechoslovakia: 3 ex. (NHMV) • Denmark: 1 ex. (ZMAN) • France: 33 ex. (BMNH, MOG, NHMV, RMNH, ZMAN, Jongema, Huijbregts, Vondel) • Germany: 16 ex. (NHMV) • Great Britain: 3 ex. (ZMAN) • Greece: 11 ex. (NHMV, ZMAN, Berge Henegouwen) • Hungary: 6 ex. (NHMV, RMNH, ZMAN) • Iran: 3 ex. (BMNH) • Italy: 4 ex. (NHMV, Jongema) • Jugoslavia: 19 ex. (NHMV, ZMAN) • Kazakhstan: 1 ex. (NHMV) • Morocco: 10 ex. (BMNH) • Netherlands: 750 ex., all provinces • Poland: 9 ex. (NHMV, RMNH) • Portugal 11 ex. (RMNH, ZMAN, Nieser) • Rumania: 1 ex. (NHMV) • Russian Federation: 1 ex. (NHMV) • Switzerland: 1 ex. (Jongema) • Turkey: 31 ex. (NHMV, RMNH) • Ukraine: 6 ex. (NHMV, RMNH).

Peltodytes coomani Peschet
(figs. 16 -26)

Peltodytes coomani Peschet, 1923: 178. Lectotype ♂ (here designated), Hoa Binh, Tonkin [Vietnam], V.VI.1922, A. de Cooman, TYPE, Museum Paris, 1945, Coll. R. Peschet, *Peltodytes coomani* n. sp. R. Peschet (MNHN) [examined].

Peltodytes wui Gschwendtner, 1934: 107. Lectotype ♂ (here designated), Canton [China], Collector C. F. Wu, Type Gsch., Hal. 42, Coll. Gschwendtner, *Peltodytes wui* Gsch., det. Gschwendt., Type. (OLML) [examined]. **syn. n.**

Peltodytes coomani; Zimmermann 1924: 208.

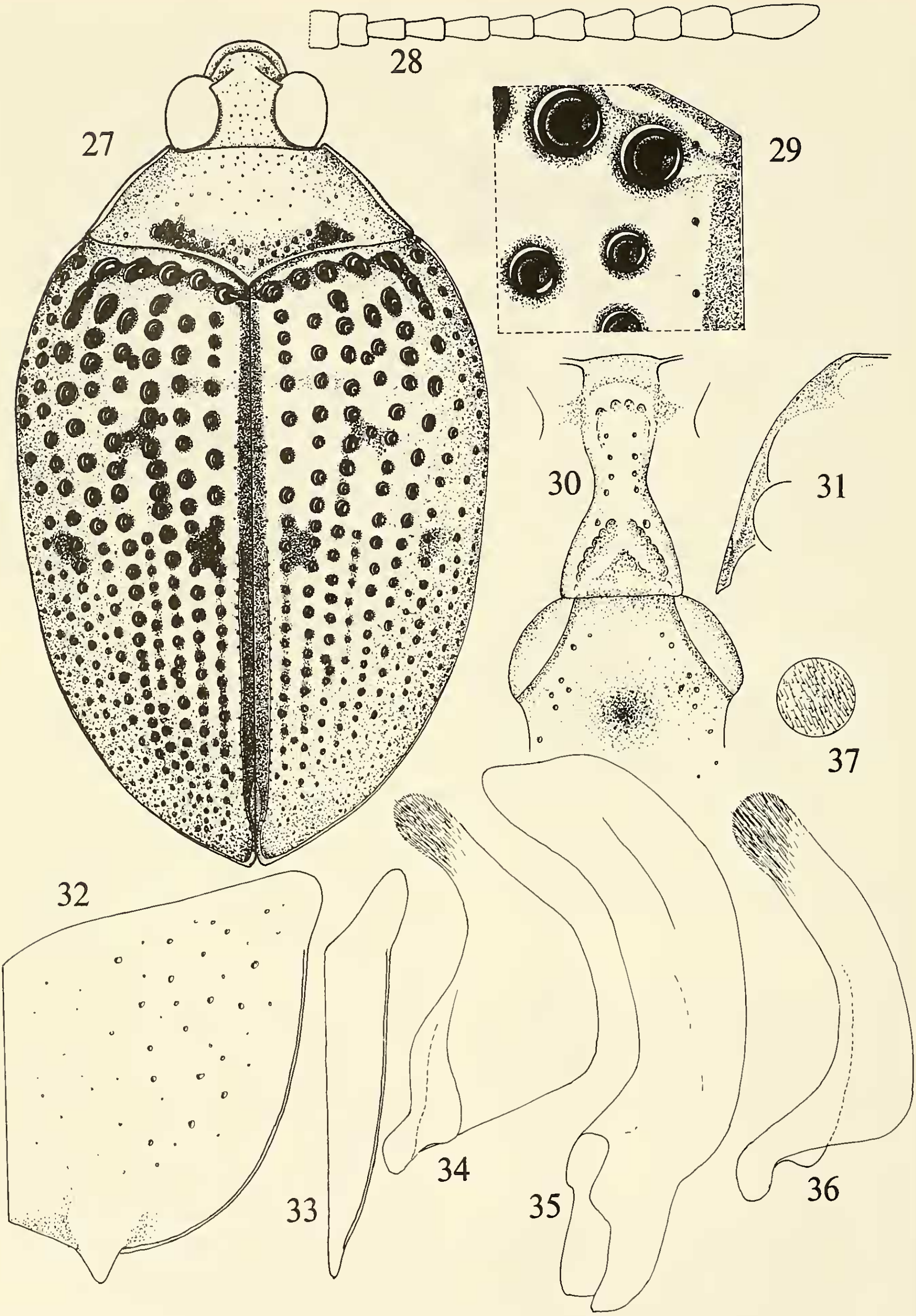
Description

Length 3.2-3.5 mm, width 1.9-2.1 mm. Body wide, subparallel in the middle (fig. 16).

Head: Yellow-brown to yellow-red, seen from beside brown marks behind eyes, sometimes two small vague spots on vertex. Weakly to moderately strongly punctured. Distance between eyes 0.7-0.8× width of one eye. Antennae yellow to yellow-brown, last segment usually darkened at top, segment 3-6 longer than wide, segment 7-10 more than twice as long as wide (fig.17). Palpi yellow to yellow-brown.

Pronotum: Yellow to yellow-brown, dark mark opposite third elytral puncture-rows, slightly impressed between these marks. Lateral borders slightly to clearly convex, margins from very strong posteriorly to narrow anteriorly, posterior corner clearly protruding. Sparsely, but in marginal parts sometimes coarsely punctured, in basal dark marks one very large and sometimes a few smaller punctures recognizable.

Elytra: Yellow to yellow-brown, suture completely dark, towards base slightly narrowed, usually dark mark between first and second and between third and fifth puncture-row, sometimes without marks. Posterior part bulbous, covering margins when seen from above. Apical part of margin concave. Puncture-rows moderately strong, basal punctures widened and connected by a slight impression (fig. 18). Additional puncture-row in second interval restricted to about 6 punctures in posterior part. Fourth puncture-row on-



Figs. 27-37. *Peltodytes dauricus*, figs. 27-33, holotype, figs. 34-37, Harbin. – 27, dorsal view; 28, antenna; 29, punctures near elytral base and suture; 30, prosternal process; 31, lateral view of prosternal process; 32, metacoxal plate; 33, lateral view of metacoxal plate; 34, left paramere; 35, penis; 36, right paramere; 37, surface of apical part of parameres.

ly represented by 1 to 4 punctures in basal part. No recognizable additional puncture-rows in seventh and ninth interval. In impression in front of bulbous apex a clear puncture-row from suture to lateral margin. All punctures darkened, sometimes marginal and epipleural punctures not darkened.

Underside: Yellow to yellow-brown, legs yellow-brown, darkened near coxae. Epipleura punctured, punctures usually brown, not as dark as elytral puncture-rows. Prosternal process grooved, groove interrupted in posterior part, strongly punctured (fig. 19 and 20). Prosternum with uncoloured punctures, anteriorly only margined close to prosternal process. Metasternal process slightly impressed anteriorly and strongly posteriorly, weakly punctured (fig. 19). Metacoxal plates with a weak tooth, posterior sutural corner weakly margined, strongly punctured except in sutural area (fig. 21 and 22). Setiferous striole on dorsal face of hind tibia about 1/4× length of tibia, longest of two tibial spurs about 2/3× length of first tarsal segment.

Male: Penis and parameres as in figs. 23-25. Surface of apical parts of parameres areolate (fig. 26).

Immature stages: Unknown.

Distribution (fig. 101)

Vietnam, China (prov. of Guangdong)

Material examined. – Vietnam: 1 ♂, lectotype, 8 paralectotypes with same labels as lectotype (4 in MNHN and 4 in RMNH); 29 ex., Tonkin, Hoa Binh, leg. A. de Cooman (dates, if present, varying from 1932 to 1934) (ISNB, RMNH, MNHN); 3 ex., Annam, Rég. de An-ninh. R. P. M. Mannier, dr. Régimbart vidit 1903, ex. coll. Oberthür (1 ex. labelled: *Peltodytes variabilis* Clk.) (MNHN) • China: 1 ♂, lectotype of *P. wui* (OLML); 2 ex., Canton [Guangzhou], Mell S. V. (1 ex. with date x.10)(ZMHB); 2 ex., Hainan Id., S. China, SW of Nodoa, Tan-hsien (Distr.), 17.vii.1929. Lingnan University, Fifth Hainan Expedition (BPBM).

Peltodytes dauricus Zimmermann
(figs. 27-37)

Peltodytes dauricus Zimmermann, 1924: 8. Holotype ♀ (by monotypy), Nikolsk, Ussurijsk, Mandl, Type, Holotypus Staatssamml. München (ZSMC) [examined].

Peltodytes dauricus; Wu 1932: 341, J. Balfour-Browne 1946: 436, Zaitsev 1953: 36 (as jun. syn. of *intermedius*).

Description

Length 4.2 mm, width 2.4 mm. Body wide, subparallel. (fig. 27).

Head: Yellow-brown, weakly punctured. Distance between eyes 0.9× width of one eye. Antennae (fig. 28) and palpi yellow-brown.

Pronotum: Yellow-brown, basal dark marks opposite third elytral puncture-row. Impressed between basal marks. Weakly punctured, three or four strong dark punctures in basal marks clearly smaller than elytral basal punctures, about 15 dark punctures in impression between basal marks. Lateral borders convex, margins widest in the middle, not wider than antennae.

Elytra: Yellow-brown, very strong puncture-rows, although punctures are usually separately darkened, the strong darkening gives the elytra a striped appearance. Suture darkened, small marks between first and second, between third and fifth and between eighth and tenth row. Fourth row missing about five punctures in the middle. Additional puncture-rows present in posterior half of seventh and ninth interval. No or only few additional punctures in apical part of second interval. Basal punctures in a common transverse impression (fig.29). All punctures ringlike impressed: centre of puncture is slightly raised. Very small punctures along suture. Sutural stria in posterior half.

Underside: Yellow-brown to brown, legs yellow-brown to brown around coxae. Elytral epipleura yellow-brown, weak punctures uncoloured. Prosternal process strongly narrowed near coxae, in anterior part usually without a clear margin, with various impressions and coarse punctures (fig. 30, 31). Prosternum margined anteriorly, except near epipleura, at most very weakly and sparsely punctured. Metasternal process flat with a pit in the middle, sparsely punctured, the part covering the mesocoxae separated by a clear plica (fig. 30). Metacoxal plates with a strong but not very sharp tooth (fig. 32, 33). Setiferous striole on dorsal face of hind tibia about 1/5× length of tibia, longest of two tibial spurs about 2/3× length of first tarsal segment.

Male: Penis and parameres as in figs. 34-36. (illustrated for the first time by J. Balfour-Browne (1946). Surface of apical parts of parameres hairy (fig. 37).

Immature stages: Unknown

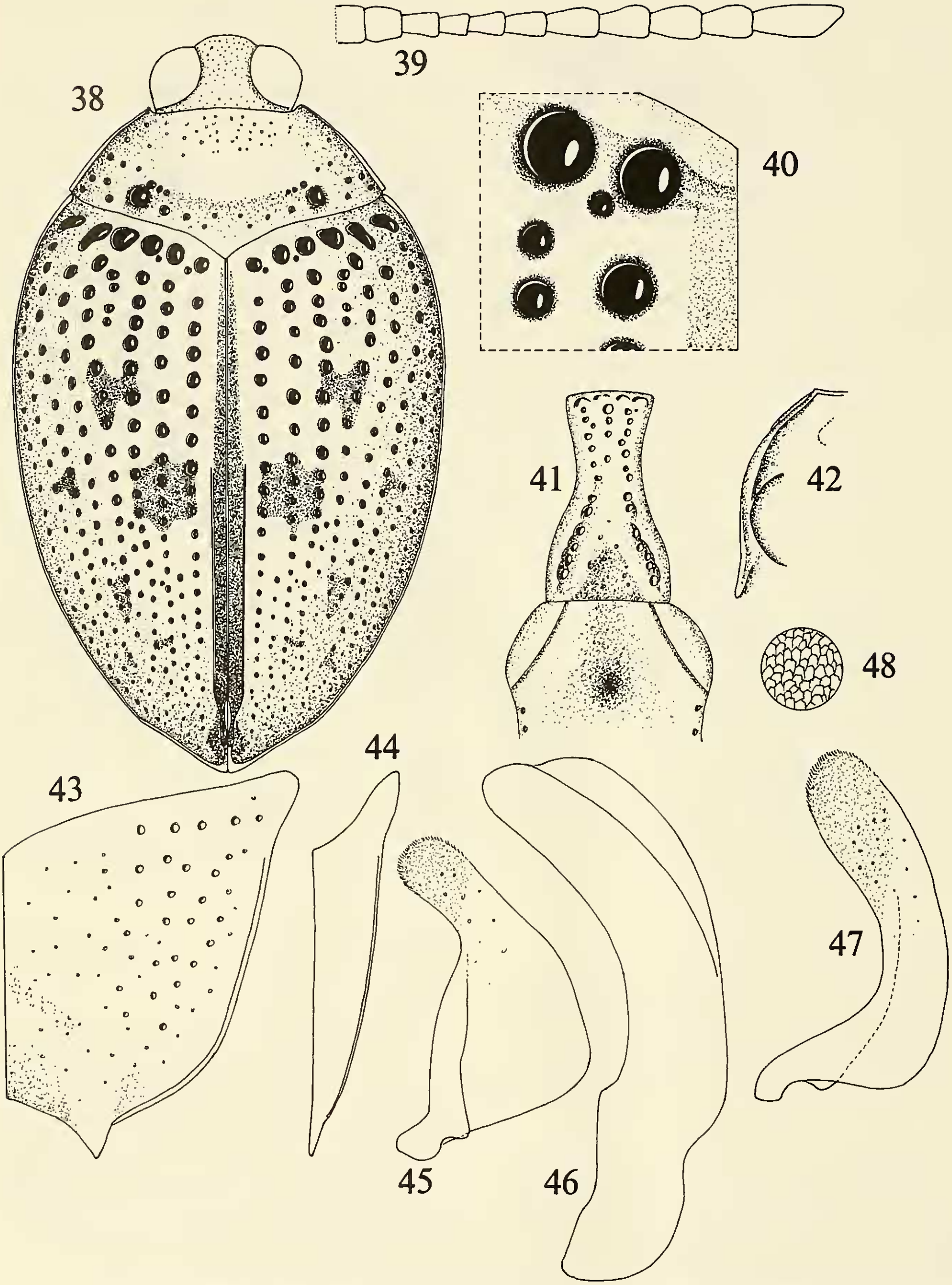
Distribution (fig. 98)

Russian Federation near Wladiwostok, China province Heilongjiang.

Material examined. – Russian Federation: ♀ Holotype (ZSMC) • China: 1 ♂, Weishaha [Weihe], Manch, 20.vii.1939, M. Weymarn; 3 ex., Hsiaoling [?], Manchuria, vii.1939, M. Weymarn; 1 ex., Harbin, Manchuria, 22.ix.1940, M. Weymarn, *Peltodytes dauricus* Zimm., J. Balfour-Browne det. 1944; 4 ex., Charbin [Harbin], 5.-viii.1952, BM.1953-715; 3 ex., Charbin [Harbin], 2.x.1952, BM.1953-715; 2 ex., Heilungkiang [Heilongjiang], Harbin, 13.vi.1965 & 26.vi.1966, P.M. Hammond, BM 1967-215 (BMNH).

Peltodytes intermedius (Sharp)
(figs. 38-48)

Cnemidotus intermedius Sharp, 1873: 55. Lectotype ♀ (here designated), "Type [round label with red margin], Japan



Figs. 38-48. *Peltodytes intermedius*, Japan: Yokoshima. – 38, dorsal view; 39, antenna; 40, punctures near elytral base and suture; 41, prosternal process; 42, lateral view of prosternal process; 43, metacoxal plate; 44, lateral view of metacoxal plate; 45, left paramere; 46, penis; 47, right paramere; 48, surface of apical part of parameres.

Lewis [label with yellow middleband], Japan [yellow oval label], Sharp coll. 1905-313, *Cnemidotus intermedius* type DS. [according to description abundant at Nagasaki] (-BMNH) [examined].

Peltodytes intermedius; Régimbart 1899: 191, Peschet 1923: 179, Zimmermann 1919: 75, 1920: 300, 1924: 7, Takizawa 1931: 138, Wu 1932: 341, Zaitsev 1953: 36, Nakane 1963: 55, 1987: 27, Satô 1963b: 23, 1984: 3, Yoon 1988: 620.

Description

Length 3.2-3.7 mm, width 1.9-2.2 mm. Body wide, subparallel, widest in the middle. (fig. 38)

Head: Yellow to yellow-brown, moderately strongly and densely punctured. Sometimes with a slightly darkened collar, which does not reach the eyes. Distance between eyes 0.8-1.0× width of one eye. Antennae (fig. 39) and palpi yellow.

Pronotum: Yellow, basal dark marks opposite fifth elytral puncture-row, containing 2 or 3 widened punctures. Slightly impressed between basal marks. Strong darkened punctures along base and in hind corners, weak not or only sligthly darkened punctures in anterior and discal part. Lateral borders straight to convex, margin not wider than antennae, narrowed anteriorly.

Elytra: Yellow, suture darkened, four larger and some small dark marks on each elytron, of which discal one is separated from suture. Puncture-rows strong. Fourth puncture-row widely interrupted, usually only one to three punctures remaining near base and at most about five apically. Basal punctures of first five rows strongly widened. Apically about 10-15 punctures in second interval. Apically remains of additional puncture-rows in seventh and ninth interval. All punctures darkened. Apical margin not clearly concave. Completely margined. Striae along suture in posterior half. Along suture weak and dense darkened punctures. Apical part slightly bulbous.

Underside: Yellow to yellow-red, legs yellow to yellow-red, darkened towards coxae. Elytral epipleura yellow, anterior part with dark punctures, reaching middle of last sternite. Prosternal process narrowed near coxae, moderately strongly punctured, slightly impressed in the middle, posteriorly with a central impression and a punctured stria on each side, anteriorly weakly margined (fig. 41, 42). Metasternal process with deep pit in the middle, hardly punctured, weak striae along coxae (fig. 41). Metacoxal plates with small sharp tooth, not reaching last sternite, in lateral view also sharp, posterior part between teeth bent down to the body, densely punctured, all punctures about equal in strength and uncoloured (fig. 43, 44). Setiferous striole on dorsal face of hind tibia 1/2-1/3× length of tibia, longest of two tibial spurs about 3/4× length of first tarsal segment. Last sternite unpunctured, impressed beside the middle.

Male: Penis and parameres as in figs. 45-47. Surface of apical part of parameres areolate (fig. 48).

Immature stages: According to Bertrand (1972) the larva was described by Fukuda, Kurosa and Hayashi (publication unknown to me).

Biology

Found in ponds and in a river.

Distribution (fig.99)

Japan, China, Korea. Zimmermann (1919) gives Taiwan, Zaitsev (1953) gives the most eastern part of the Russian Federation.

Material examined. – Japan: Kyushu: Lectotype (BMNH); 4 ex., Nagasaki, Hilsendorf (ZMHB); 10 ex., Ikenosono, Konyama T, Kagoshima Pref., 6.x.1985, leg. E. Matsui; 10 ex., Yokoshima T, Taman-gun, Kumamoto Pref., 9.vi.1986, leg. E. Matsui (Vondel); Tsushima: 1 ex., P. Holst; 1 ex., Tsu-sima, vii-x.1891 (BMNH); Honshu: 4 ex., Tokio, 25-27.ix.1881, G. Lewis; 1 ex., Yokohama,1.i-9.ii.1881, G. Lewis (BMNH); 1 ex., Kobe, 20.vii.1916, leg. J. E. A. Lewis (-BPBM); 3 ex., Surr. Tokio, Bodemeyer (RMNH); 2 ex., Tokio; 8 ex., Yedo [river Edo], vii.1875, leg. Hilsendorf (ZMHB); Hokkaido: 1 ex., Sapporo, 5-16.viii.1880, G. Lewis (BMNH); 5 ex., Obihiro, 24.vii.1906, H. Schoede S. G. (ZMHB); 1 ex., Hakodate, 1897, R.P. Faurie (MNHN); Japan (Island unknown): 1 ♀, Japon, Det. Sharp, Lewis, *intermedius*, det. Sharp 1873, *Peltodytes intermedius* Shp, Type (-ISNB); 2 ex., Okitsu [?], iv+v.1913, F. Muir (BPBM); 7 ex., Chiuzenji [?], 19-24.viii.1881, G. Lewis; 15 ex., Chiuzenji, G. Lewis; 1 ex., Chuzai, Chiuzenji, G. Lewis; 2 ex., Sarsiew [?], 20.ix.1909, J.E.A. Lewis; 25 ex., Lewis, 15.ix.1881 or 29.x.1881; 8 ex., G. Lewis, (some 9.iii.1881); 1 ex, G. Lewis; 1 ex., 1896, Lord Dormer (BMNH); 2 ex., Hiller S.; 2 ex., Hilsendorf (ZMHB) • China: 1 ex., 5. Shanghai (RMNH); 1 ex., Peping [Beijing], C.F. Wu (OLML) • Korea: Kangwon-do: 3 ex., Wonsong-kun, Kyangkyok, pond, 3.viii.1988; Chungpuk-do: 1 ex, Chunchon-city, Chiljon-dong, 5.-viii.1988; 3 ex., Chungwon-kun, Chisil-pond, 16.viii.1987; 4 ex., Poun-kun, Chisan-ri, 17.viii.1989; 3 ex., Sintanjin-city, 21.vii.1987; Kyongnam-do: 2 ex., Yangson-kun, Taesok-pond, 22.x.1988; 2 ex., Chinryang-kun, Kumsan-pond, 11.viii.1989; Kyongki-do: Kwangju-kun, Chungang-pond, 20.viii.1989; Chonnam-do: 2 ex., Imsil-kun, Samgye-ri, 14.viii.1989; 5 ex., Namwon-kun, Okrim-pond, 13.viii.1989; Kyongpuk-do: 3 ex., Yongpung-kun, Hwayon-pond, 2.viii.1988 (Vondel, ex coll. Sung Hwa Lee).

Peltodytes pekinensis sp. n.

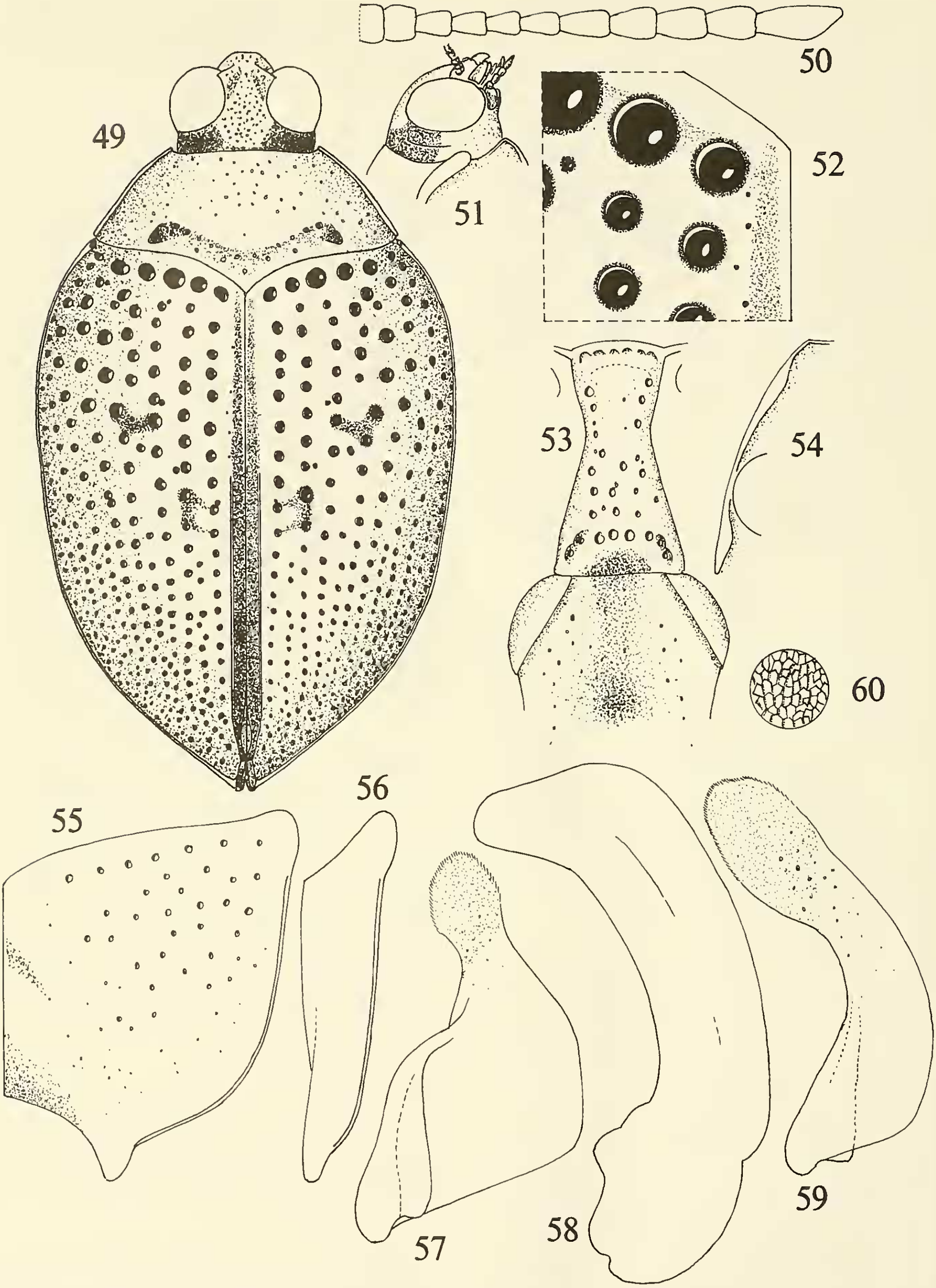
(figs. 49-60)

Type material. – Holotype ♂, "Peping [Beijing], Collector C. F. Wu, coll. Gschwendtner, *intermedius* Shp, det. Gschwendtner" (OLML). – Paratypes, 1♂, 1♀: 1 ♀, data as holotype (coll. Vondel); 1 ♂, "China, Peking [Beijing], vii.[19]13 (ZMHB)

Description

Length 3.6-3.9 mm, width 2.1-2.2 mm. Body widest just behind shoulders, in the middle subparallel (fig. 49).

Head: Yellow to yellow-brown, dark mark on neck reaching downwards to halfway height of eyes (fig.



Figs. 49-60. *Peltodytes pekinensis*, Holotype. – 49, dorsal view; 50, antenna; 51, lateral view of head; 52, punctures near elytral base and suture; 53, prosternal process; 54, lateral view of prosternal process; 55, metacoxal plate; 56, lateral view of metacoxal plate; 57, left paramere; 58, penis; 59, right paramere; 60, surface of apical part of parameres.

51). Strongly and densely punctured, slightly impressed behind front margins near antennae. Distance between eyes 0.6-0.8× width of one eye. Antennae yellow to yellow-brown, top of last segment slightly darkened (fig. 50). Palpi yellow-brown to brown.

Pronotum: Yellow. Lateral borders convex in anterior third part, clear margins not wider than antennae, slightly narrowed anteriorly. Sparsely punctured, basally opposite each fifth elytral puncture-row one strong deep puncture together with two or three smaller punctures included in a dark mark, impression between these marks with few sometimes slightly darkened punctures.

Elytra: Yellow, usually small marks in second and fourth interval, dark suture narrowed towards base. Strong puncture-rows, basal punctures of row 1, 2, 3 and 5 widened and connected by a weak impression (fig. 52). Additional posterior puncture-row in second interval reaching about as far as the middle, additional posterior puncture-rows in seventh and ninth interval clearly present. Sutural stria in posterior half reaching the middle, along suture small sparse punctures.

Underside: Yellow, legs yellow, hind femura, coxae and tarsi of all legs yellow-brown to brown. Prosternal process narrowed near coxae, sharp halfcircular impression at posterior margin, strongly and coarsely punctured (fig. 53 and 54). Metasternal process grooved and with a pit in the middle, weakly and sparsely punctured (fig. 53). Metacoxal plates with a strong blunt tooth easily reaching last sternite, tooth in lateral view also strong and blunt, suture of coxal plates posteriorly only bending weakly towards body (fig. 55 and 56). Last sternite unpunctured. Epipleura with clear darkened punctures. Setiferous striole on dorsal face of hind tibia about 1/4× length of tibia, longest of two tibial spurs about 3/4× length of first tarsal segment. Male: Penis and parameres as in figs. 57-59. Surface of apical parts of parameres areolate (fig. 60).

Immature stages: Unknown

Distribution (fig. 98)

Only known from Beijing, China.

Peltodytes rotundatus (Aubé)
(figs. 61-73)

Cnemidotus rotundatus Aubé, 1836: 40. Syntypes: Southern France and Italy (probably in MNHN) [not examined].
Cnemidotus conifer Seidlitz, 1887: 35. Syntypes: Sicily. (probably in ZSMC) [not examined].
Cnemidotus rotundatus; Seidlitz 1887: 35.
Peltodytes rotundatus; Zimmermann 1920: 300, 1924: 8, Falkenström 1939: 2, Guignot 1947: 37, 1959: 23, Lagar Mascaro 1951: 76, Zaitsev 1953: 36, Freude 1971: 10, Franciscolo 1972: 63, 1979: 70, Ienistea 1974: 204, Angelini 1984: 48, Ferreras Romero 1987: 20, Leblanc 1990: 1.C.5.
Peltodytes conifer; Escalera 1914: 56, Zimmermann 1920: 299.
Peltodytes rotundatus var. *conifer*; Zimmermann 1924: 8, Guignot 1947: 37, 1959: 23.
Peltodytes rotundatus ssp. *conifer*; Zaitsev 1953: 37, Franciscolo 1979: 70, Guéorguiev 1981: 400, Angelini 1984: 48.

Remarks

Aubé's original description of *rotundatus*, in which the specific character of the sharp tooth on the metacoxal plate is mentioned, leaves no doubt about the identity of this species.

The species or subspecies or variety *conifer* differs from *rotundatus* in having weaker elytral punctures and a less interrupted fourth elytral puncture-row. These characters, however, are very variable and all kind of intermediate forms may be met with.

Description

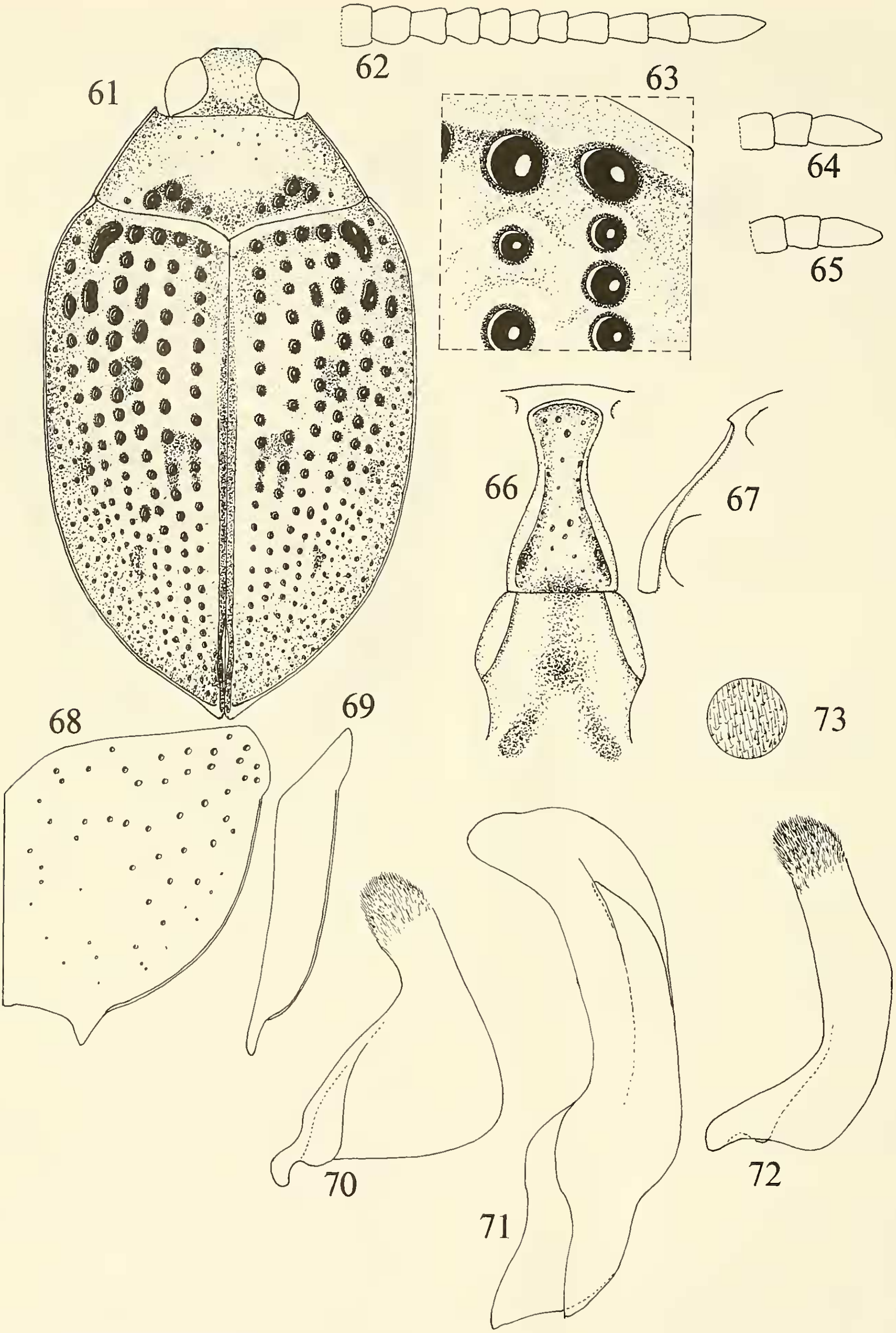
Length 3.3-3.9 mm, width 2.0-2.2 mm. Body wide, subparallel, widest in the middle (fig. 61).

Head: Yellow to yellow-brown, vertex slightly darkened. Moderately strongly punctured, on vertex with strong dense darkened punctures. Distance between eyes 0.7-1.1× width of one eye. Antennae yellow, first six segments wider than long (fig. 62). Palpi yellow to yellow-brown (fig. 64 and 65).

Pronotum: Yellow to yellow-red. Along base a row of darkened punctures, of which the ones opposite fifth elytral puncture-row are widened, base between these widened punctures strongly impressed. Lateral and anterior part with sparse uncoloured punctures. Lateral margins slightly concave to slightly convex, not wider than antennae.

Elytra: Yellow with or without vague marks on intervals, narrowly darkened suture faded towards base, sutural striae on about posterior half. Completely margined, margin apically abruptly bent. Puncture-rows weak to very strong, 24-28 punctures in first row. Posteriorly between first and second row usually no punctures, but occasionally some punctures present, remains of additional rows on posterior part of seventh and ninth interval present. Fourth row widely interrupted, anterior part varying from 0-4 punctures. Widened basal punctures in a clear transverse impression (fig. 63). All punctures darkened.

Underside: Yellow to yellow-red, legs yellow to yellow-red, coxae brown, elytral epipleura yellow with darkened or uncoloured punctures. Prosternal process narrowed near coxae, posteriorly impressed, laterally with plicae formed by coarse punctures, anterior side clearly margined, usually strongly punctured



Figs. 61-73. *Peltodytes rotundatus*, Portugal: Algarve. – 61, dorsal view; 62, antenna; 63, punctures near elytral base and suture; 64, maxillair palpus; 65, labial palpus; 66, prosternal process; 67, lateral view of prosternal process; 68, metacoxal plate; 69, lateral view of metacoxal plate; 70, left paramere; 71, penis; 72, right paramere; 73, surface of apical part of parameres.

(fig. 66 and 67). Metasternal process with strong impression in the middle, weakly punctured, plicae along coxae (fig. 66). Metacoxal plates with long sharp tooth, reaching last sternite, moderately strongly punctured, near suture weakly punctured (fig. 68, 69). Last sternite unpunctured, apex with micropunctuation. Setiferous striole on dorsal face of hind tibia 1/4× length of first tarsal segment.

Males: Penis and parameres as in figs. 70-72. Surface of apical part of parameres hairy (fig. 73).

Immature stages: Third stage larvae described by Bertrand (1951: 76)

Biology

Living between filamentous algae in lakes, pools, ponds, rivers, marshes, brooks, streamlets. Among vegetation of *Utricularia*, *Nuphar* and other waterplants. Attracted to light.

Distribution (fig. 97)

Mediterranean area: Portugal, Spain including the Baleares, France including Corsica, Italy including Sardinia, Jugoslavia, Albania, Greece including Crete, Morocco. Escherich (1897) gives Turkey.

Material examined. – Albania: 3 ex., Elbasan, 10+15.ix.1918, Priesner (NHMV) • France: 1 ex., Castelnau-le-Lez; 1 ex., Toulouse; 1 ex., Biaritz; 1 ex., Chatellerault; 4 ex., Carcassonne; 3 ex., Pau; 1 ex., Gers; 1 ex., Ripaud, Aude, 12.vii.1973, Davidson, at light; 2 ex., Narbonne, Etang de Leucate, 5.viii.1956, Eckerlein; 2 ex., Bruges, Pyr. Atl., 27.vii.1990; 11 ex., Corsica, Porto, 8.vi.1976, stream in alder-marsh nr sea, van Nieukerken; 3 ex., Corsica, Ghisonaccia, Fium Orbo River, 23.vi.1976, van Nieukerken; 8 ex., Corsica, Miomo, 5km N. of Bastia, 24.vi.1976, van Nieukerken; 2 ex., Lyon; 1 ex., Lac d'Hourtin, Medoc, 28.ix.1973, Jongema; 1 ex., Near Uzès, Gard, 11.vii.1987, Schilthuizen; 16 ex., from unknown locality (BMNH, NHMV, RMNH, ZMAN, Jongema, Schilthuizen, Vondel) • Greece: 5 ex., Attika; 1 ex., Kreta [Kriti], Kroeses, 14.iv.1933; 1 ex., Morea, Parnon Mt.; 1 ex., Athinai; 33 ex., Lakonia, 5 km SE Sparti, 27.ix.1962; 4 ex., Ilia, Olympia, 2-3.x.1962; 18 ex., Corfu [Kérkira], Sindari, brook, 15.vii.1972, Berge Henegouwen (NHMV, RMNH, ZMAN, Berge Henegouwen) • Italy: 4 ex., Sardinia, Nuoro, R. d'Oliena nr. St. Giovanni, 24.viii.1987, Berge Henegouwen; 2 ex., Sardinia, Muravera, 24.v-20.vi.1965, Budberg; 2 ex., Pieris, Friaul, Müller; 7 ex., Riva, Tirol; 1 ex., Genova; 1 ex., Lucania face F. Basento, 22.iv.1970, Angelini; 2 ex., from unknown locality (NHMV, RMNH, Berge Henegouwen) • Jugoslavia: 1 ex., Hercegovina, Dracevo, v.1911; 4 ex., Castelnuovo [Herzeg Novi], Dalmatia (NHMV) • Morocco: 1 ex., Defilia, nr. Figuig, 5-20.iv.1966(BMNH); 1 ex., Tiznit, 27.vii.1959, Eckerlein (NHMV); 1 ex., Haute Atlas, Tamanar, 100 km N. of Agadir, 25.iv.1961, Dorgelo (ZMAN) • Portugal: 1 ex., betw. Setubal and Marateca, 18.ix.1976, Berge Henegouwen;1 ex., betw. Palma and Marateca, 13.vii.1973, stagnant ditch with *Utricularia* and *Nuphar*, muddy water, Berge Henegouwen; 1 ex., Palma, Rio San Martinho, 18.ix.1976, Berge Henegouwen; 1 ex., Alentejo, Rio Mira, nr. S. Ana da Serva, 21.ix.1976, Berge Henegouwen; 5 ex., Algarve, 10 km S. Sao Marcos da Serva, 21.ix.1976, Berge Hennegouwen; 7 ex., Alentejo, 15 km N. Santa Clara a Velho, 18.ix.1976, Berge Henegouwen; 3 ex., Veiros, Riba d'Ana Laura, 25.ix.1976, Berge Henegouwen; 7 ex., Algarve, Guerenca, Riba, Algibre, 16.iv.1981, Berge Henegouwen; 1 ex., Evora, 19.viii.1967; 1 ex., Evora, 4 km N. Arraiolos, 3.v.1986, Kanaar; 6 ex., Evora, streamlet of Quintel, Pera Manca, 19.-viii.1967, Nieser; 7 ex., Algarve, Quanteira, 24-29.xii.1967, Nieser; 4 ex., Algarve, nr. Estof, 19.vii.1971, Nieser; 3 ex., Rio Antua, S. Estaroja, 22.iv.1976, Nieser (RMNH, ZMAN, Berge Henegouwen, Kanaar, Nieser) • Spain: 4 ex., Cost Brava, vi.1966 & vi.1967, Budberg; 1 ex., Llambillas, Gerona, 4-5.viii.1956, Eckerlein; 7 ex., Posadas, 18-19.iv.1925; 3 ex., Pollensa, Mallorca; 14 ex., Albufeira, Mallorca (partly 15.vi.1913); 1 ex., Valencia; 1 ex., Palencia; 2 ex., Abadia, prov. Caceres, alt. 700 m., 5.v.1960; 1 ex., nr. Rosal de la Frontera, Rio Chanca, stagnant pools in dry river course, vii.1973, Berge Henegouwen; 2 ex., Caceres, Puerto Roque, Rivera David, 26.ix.1976; 1 ex., Baleares, Pont de Giretto, S. Soller, 6.v.1983, Stock; 1 ex., Pyrenes, San Jaume de Llierca, riv. Fluvia, 12.viii.1987, Vallenduuk (NHMV, RMNH, ZMAN, Vallenduuk) • Unknown country: 9 ex. (NHMV, RMNH).

Peltodytes sinensis (Hope)

(figs. 74 -84)

Haliplus sinensis Hope, 1845: 15. Lectotype ♀ (here designated), [China, Canton] Dr. Cantor Penang, Type, 60.15, E.I.C., *Sinensis.* Hope (BMNH) [examined]

Haliplus variabilis Clark, 1863: 417. Lectotype ♂ (here designated), China, 2056, 6756, Cotype, *Peltodytes variabilis* Clk (=*sinensis* Hope) (BMNH) [examined].

Peltodytes koreanus Takizawa, 1931: 138. Syntypes: Korea: 18 ex., Suigen, 5-15.vii.1922, T. Uchida & S. Takano; 1 ex., Eitoho, 13.vi.1923, Yuuki. (not located) [not examined].

Peltodytes sinensis; Régimbart 1899: 192, Peschet 1923: 179, Zimmermann 1920: 300, 1924: 7, Takizawa 1931: 139, Wu 1932: 341, Gschwendtner 1934: 107, Falkenström 1936a: 2, 1936b: 79, Zaitsev 1953: 36, Satô 1960: 252, 1963b: 24, 1984: 3, Cho 1969: 165, Nakane 1987: 27, Yoon 1988: 620.

Peltodytes variabilis; Zimmermann 1920: 300, 1924: 7, Satô 1963b: 24.

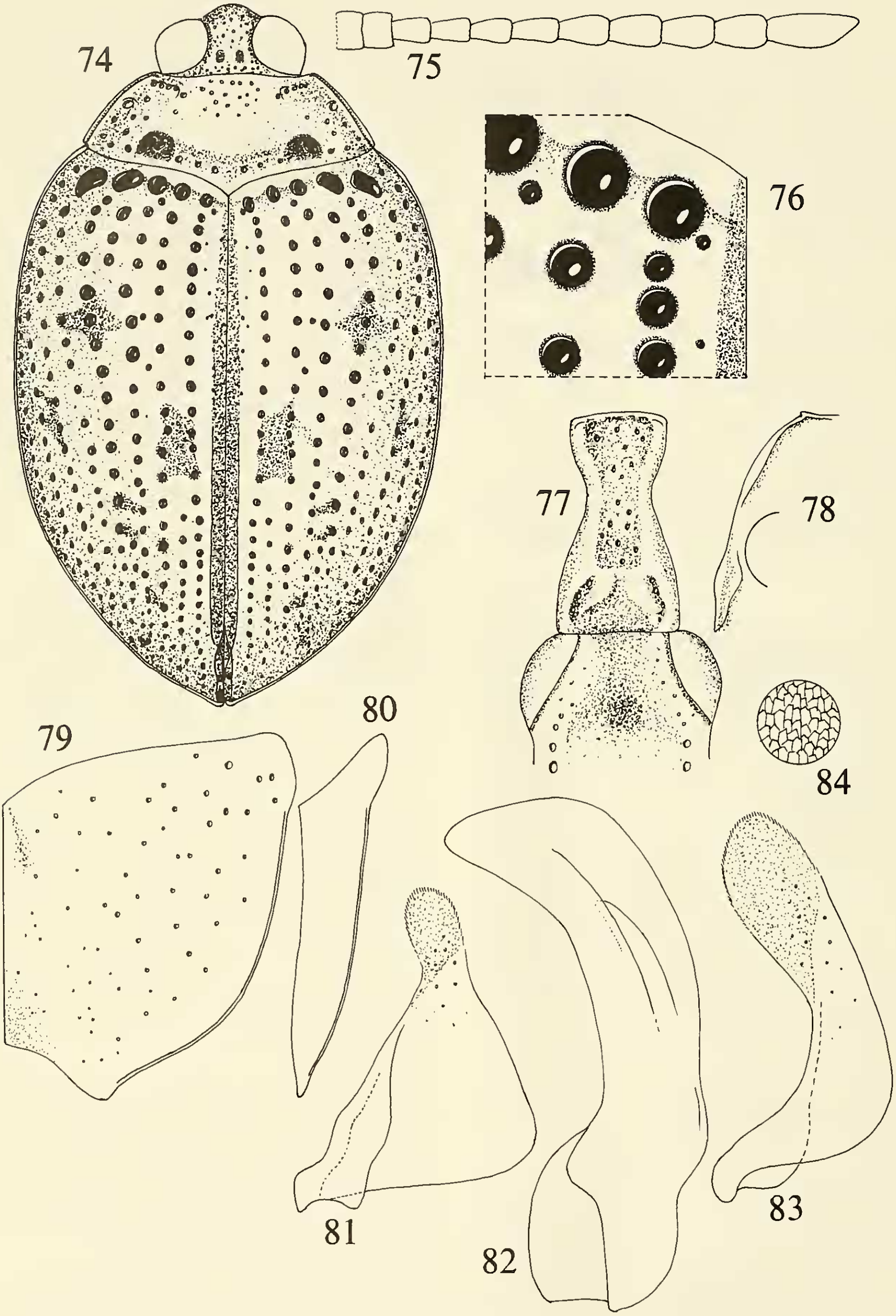
Peltodytes koreanus; Satô 1963b: 24 (synonimised with *P. sinensis*), Yoon 1988: 620.

Description

Length 3.4-3.8 mm, width 1.9-2.2 mm. Body oval, subparallel, widest in the middle (fig. 74).

Head: Yellow-brown to brown, two dark marks between eyes, usually vaguely darkened behind eyes. Moderately strongly punctured. Distance between eyes 0.6-0.7× width of one eye. Antennae (fig. 75) and palpi yellow to yellow-brown.

Pronotum: Yellow to yellow-red, dark marks opposite fifth elytral puncture-rows, containing 2-4 widened strongly impressed punctures, between basal marks impressed and with a few, sometimes darkened punctures. In hind corners 2-5 darkened punctures, else with uncoloured punctures, in front corners with



Figs. 74-84. *Peltodytes sinensis*, 74-80, holotype, 81-84, Korea.-74, dorsal view; 75, antenna; 76, punctures near elytral base and suture; 77, prosternal process; 78, lateral view of prosternal process; 79, metacoxal plate; 80, lateral view of metacoxal plate; 81, left paramere; 82, penis; 83, right paramere; 84, surface of apical part of parameres.

coarse punctures. Lateral margin not clearly wider than antennae, narrowed anteriorly.

Elytra: Yellow to yellow-red, darkened suture, four sometimes vague marks on each elytron, discal mark separated from suture, sometimes a slight narrow darkening along central part of base. Posterior part slightly bulbous, apical margin at most slightly concave. Margined completely. Punctures moderately strong and all darkened. Additional posterior row on second interval with 10-12 punctures. Fourth puncture-row widely interrupted, about 3-5 punctures anteriorly and 1 or 2 posteriorly. Short additional posterior puncture-rows in seventh and ninth intervals. Basal punctures of especially fifth and sixth row widened, connected by a transverse impression (fig. 76). Stria along posterior half of suture, in anterior half a few small darkened punctures.

Underside: Yellow to yellow-red, legs yellow to yellow-brown, metafemur, metatarsi and all coxae darkened. Elytral epipleura yellow with darkened punctures, reaching to halfway last sternite. Prosternal process narrowed near coxae, anteriorly and in posterior part impressed, posteriorly with lateral striae, strongly and sometimes coarsely punctured (fig. 77 and 78). Metasternal process with deep pit in the middle, hardly punctured, clear striae along coxae (fig. 77). Metacoxal plates with a dull tooth, reaching last sternite, strongly punctured except in weakly punctured sutural area (fig. 79 and 80). Last sternite unpunctured, impressed near front corners. Setiferous striole on dorsal face of hind tibia about 1/5× length of tibia, longest of two tibial spurs 3/4× length of first tarsal segment.

Male: Penis and parameres as in figs. 81-83. Surface of apical part of parameres areolate (fig. 84).

Immature stages: The third-stage larva is figured by Yoon (1988).

Biology

In stagnant water, in rivers. Up to an altitude of 2100 m.

Distribution (fig. 100)

China, provinces Beijing, Fujian, Guangdong, Henan, Hunan, Hupeh, Jiangsu, Jiangxi, Shanghai, Sichuan, Yunnan, Zhejiang. Korea. Japan, Ryukyu Islands. Vietnam. Taiwan. Philippines.

Material examined. – China: lectotype ♀ of *Haliplus sinensis*; lectotype of *Haliplus variabilis*; 2 paralectotypes of *Haliplus variabilis*, same labels as lectotype; 1 ex., Kwantung, Tai-ping, Lo-ting [Luoding, Guangdong], 6.vii.1932, W. E. Hoffman; 1 ex., Kwantung [Guangdong], Yim-na, Shan [?], 1200 m., 15.vi.1936, L. Gressitt; 1 ex., Yunnan, Western Hills nr. Kunming, 2100 m., 7.vii.1940, J. L. Gressitt; 1 ex., Hunan, Li, Tsinshih, T.C. Maa, 29.v.1937 (BPBM); 1 ex., Tali [Dali], Haut Yunnan; 1 ex., Nanking [Nanjing], v.1928, J.G. Needham; 3 ex., Yunnan Fou [Kunming], H. Perrot; 5 ex., Ning-po [Ningbo, Zhejiang], vii.1937 (ISNB); 4 ex., Foochow [Fuzhou, Fujian], vi.1935 & 1937-1938, M. S. Yang; 8 ex., Chusan Isl. [Zhoushan], J. J. Walker; 2 ex., Honan, Loyang [Henan, Luoyang], 6.viii.1966, P.M. Hammond (BMNH); 3 ex., Shanghai (ZMUC); 3 ex., Yunnan-Sen, 1898, Excoffier; 1 ex., Kouy Tchéou [?], 1910, P.Cavaleria; 2 ex., Shanghai; 1 ex., Dohnu [?] (MNHN); 10 ex., Yunnan-Sen; 14 ex., Tschekiang, Ning-po [Zhejiang, Ningbo]; 2 ex., Canton [Guangzhou, Guangdong], Nordfluss, v.1909, Mell (ZMHB); 2 ex., Shanghai (RMNH) • Taiwan: 1 ex., Puli (Mori), vi.1954, native collector; 35 ex., Taihoku, 4.iv+6.v+22.v.1928, F. C. Hadden (BPBM); 2 ex., Taipe City, 16.viii.191, C. F. Lee (NHMV); 1 ex., Takau, Sauter (ISNB); 35 ex., Anping, iv.1910, Sauter (ZMHB) • Korea: 7ex., Kyongki-do, Ichon-kun, Solsong-pond, 19.viii.1989; 6 ex., Chungpuk-do, Chongwon-kun, Doldari (stone-bridge)-pond, 17.viii.1989; 1 ex., Chungpuk-do, Sintanjin-city, 21.vii.1987; 2 ex., Chonnam-do, Yongam-kun, Kumho-pond, 22.vii.1988; 2 ex., Kyongki-do, Kwangju-kun, Chungang-pond, 20.viii.1989; 3 ex., Chonnam-do, Yongam-kun, Taegan-pond, 22.vii.1988; 3 ex., Chonnam-do, Imsil-kun, Samgye-ri, 14.viii.1989 (Vondel, ex. coll. Sung Hwa Lee); 1 ex., Hede Quelpaert [?], 1908 (MNHN) • Japan (Ryukyu-Islands): 3 ex., Dana, Iheya Is., Okinawa Pref., 20.viii.1989, leg. E. Matsui (Vondel).-Philippines: 5 ex., N. Luzon, Prov. Ifugao, Banaue, 22.vi.1988, K. Martin (NHMV) • Without locality: 1 ex., Boyer 800 (NHMV).

Peltodytes sumatrensis Régimbart
(figs. 85-95)

Peltodytes sumatrensis Régimbart, 1885: 55. Holotype ♀: 'Ed. Everts, (W. Dates), Medan, Deli, Sumatra; *Peltodytes sumatrensis* Régb., *type*; Type; Museum Leiden, *Peltodytes sumatrensis* Rég.' (RMNH) [examined].

Peltodytes sumatrensis; Peschet 1923: 179, Zimmermann 1920: 300, 1924: 9, 1927: 1.

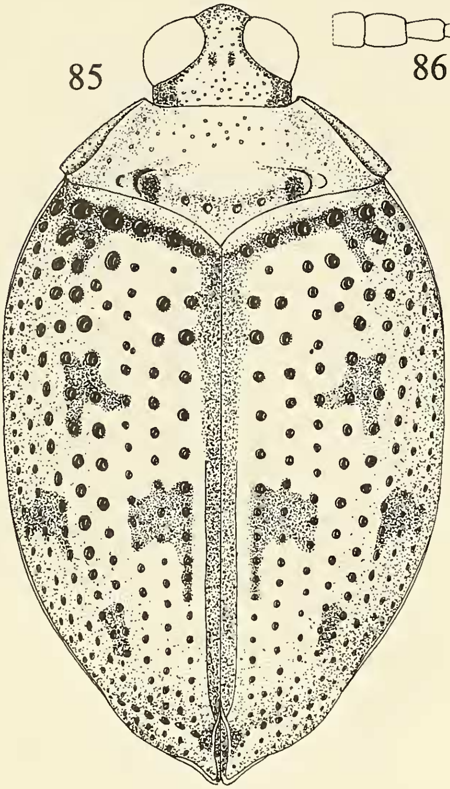
Description

Length 3.4-3.7 mm (in original description eronously given as 4.75 mm), width 1.9-2.1 mm. Body subparallel, widest in the middle (fig. 85).

Head: Yellow to yellow-brown, behind eyes, on posterior part of vertex, round eyes and on clypeus darkened, between eyes two small spots. Sparsely punctured. Distance between eyes 0.5-0.6× width of one eye. Antennae yellow to yellow-brown (fig. 86). Palpi yellow to brown.

Pronotum: Yellow, basal dark marks opposite fifth elytral puncture-row. Lateral borders slightly convex, very strong margins narrowed anteriorly. Hind corners clearly protruding. Strongly and coarsely punctured along margins, opposite third to fifth elytral puncture-row a group of two or three very large punctures, between these groups some smaller punctures in a slight impression. Except in the two basal marks all punctures colourless. Anteriorly moderately strongly punctured.

Elytra: Yellow to yellow-brown, darkened along su-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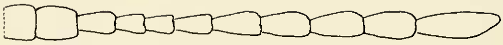
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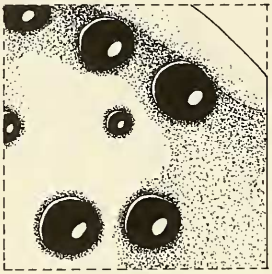
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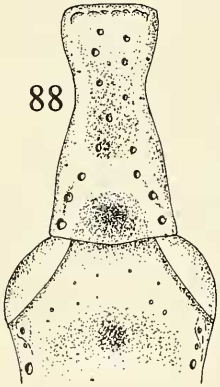
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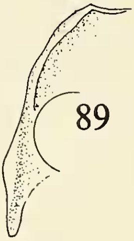
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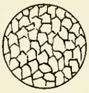
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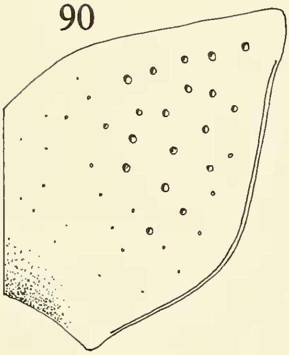
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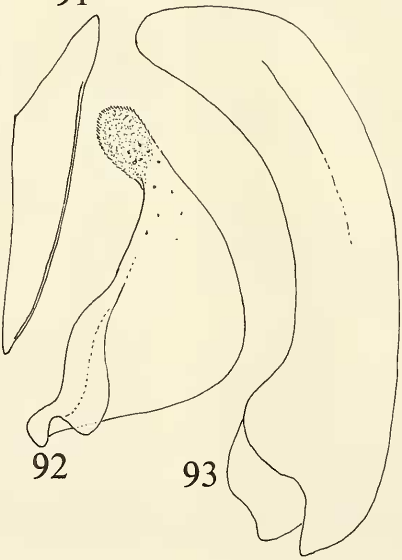
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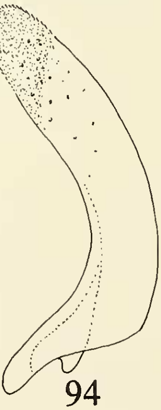
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ture, along base as far as sixth punture-row (fig. 85, 87), mark on disc and three other marks on about fifth and seventh interval. Apical part bulbous, margin near apex concave. Completely margined. Strong puncture-rows, first three rows generally weaker than following three rows, fourth puncture-row only recognizable by a few punctures in basal part. Between first and second row about five punctures in apical part. All punctures darkened. Sutural stria in posterior half.

Underside: Yellow to yellow-brown, legs yellow, hind femora, coxae, knees and tarsi yellow-brown to brown. Prosternal process narrowed near coxae, deep half circular impression at posterior margin, clearly impressed in anterior 3/4, sparsely punctured (fig. 88, 89). Metasternal process strongly impressed behind the almost flat anterior part, clear striae along mesocoxae, weakly and sparsely punctured (fig.88). Metacoxal plates with a weakly developed blunt tooth reaching last sternite, in lateral view also blunt, strongly punctured except near middle- and anterior suture (fig. 90, 91). Last sternite impressed on both sides, unpunctured. Epipleura reaching to halfway last sternite, with darkened punctures in anterior half. Setiferous striole on dorsal face of hind tibia about 1/4× length of tibia, longest of two tibial spurs about 3/4× length of first tarsal segment.

Male: Penis and parameres as in figs. 92-94. Surface of apical part of parameres areolate (fig. 95).

Immature-stages: Unknown

Biology

In stagnant water.

Distribution (fig. 101)

Indonesia, Sumatra; Thailand. Zimmermann (1924) gives Celebes (Indonesia, Sulawesi).

Material examined. – Indonesia: Holotype ♀ (RMNH); 22 ex., Sumatra, East coast, Medan, dated: 1904, 1906, vii.1920, 29.ix.1921, x.1921 (RMNH, ZMAN); 2 ex., Sumatra, Deli (ZMAN); 2 ex., Sumatra, det Régimbart 1885, *Peltodytes sumatrensis* Rég. Type [does not belong to a syntype-series as there is only the holotype] (ISNB); 1 ex., Sumatra, Samosir Isl., 2°28'N 98°49'E, Tuk-Tuk, L.Toba, 2800 ft. 4.iii.1978, M. Holmen, 13 (ZMUC); 1 ex., East coast Sumatra, Perbaoengan; 1 ex., Sumatra, Medan, Bindjai; 1 ex., Bandar, Sumatra, 23.ix.1919 (RMNH); 2 ex., N. Sumatra, Tigibinanga, West of Kabanjahe, 21.ii.1990 (16), leg. Schödl (NHMV) • Thailand: 1 ex., Bangkok, Siam, *Cnemidotus sumatrensis* Rég. R. I. Sc. N. B., coll. v. Dorsselaer, I.G.25622, *Peltodytes sumatrensis* var.?, det. B. J. v. Vondel 1989 (ISNB); 1 ex., NW-Thailand, Chiangmai Prov., Chiangdao [Ban Chiang Dao], 450 m., 5.xi.1958, in standing stagnant water (BPBM).

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Figs. 85-95. *Peltodytes sumatrensis*, 85-91, holotype, 92-95, Medan. – 85, dorsal view; 86, antenna; 87, punctures near elytral base and suture; 88, prosternal process; 89, lateral view of prosternal process; 90, metacoxal plate; 91, lateral view of metacoxal plate; 92, left paramere; 93, penis; 94, right paramere; 95, surface of apical part of parameres.

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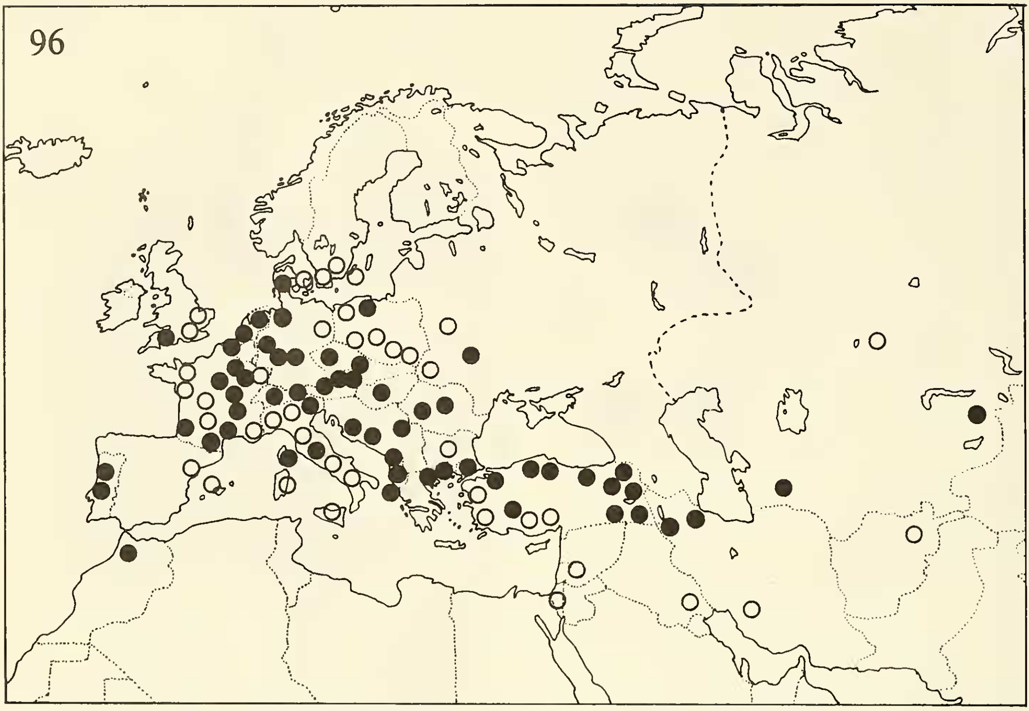

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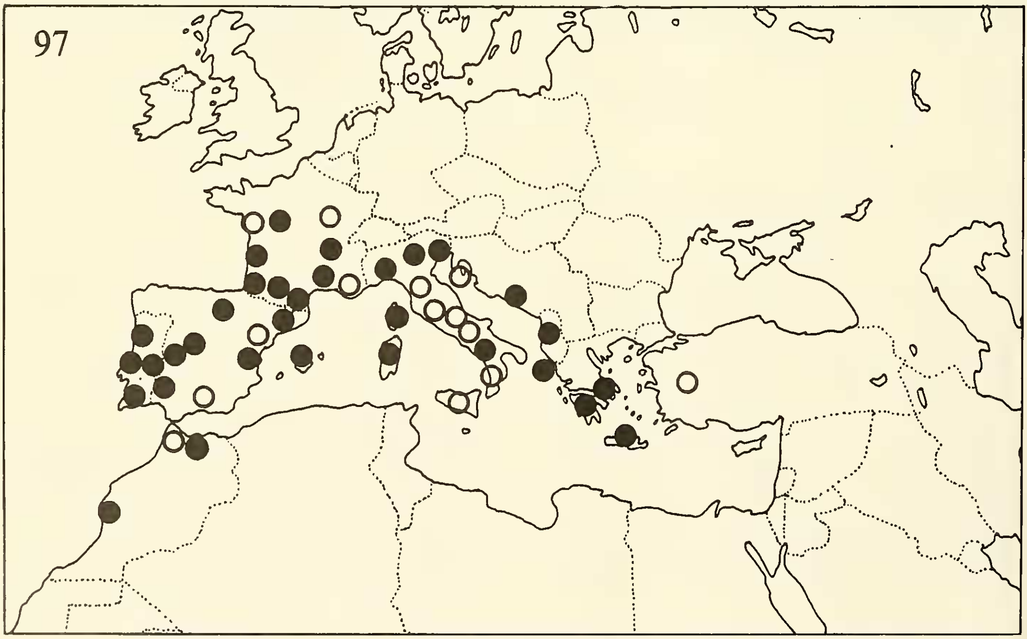

Fig. 96. Distribution of *Peltodytes caesus* (dots: examined; circles: literature records)
Fig. 97. Distribution of *Peltodytes rotundatus* (dots: examined; circles: literature records)

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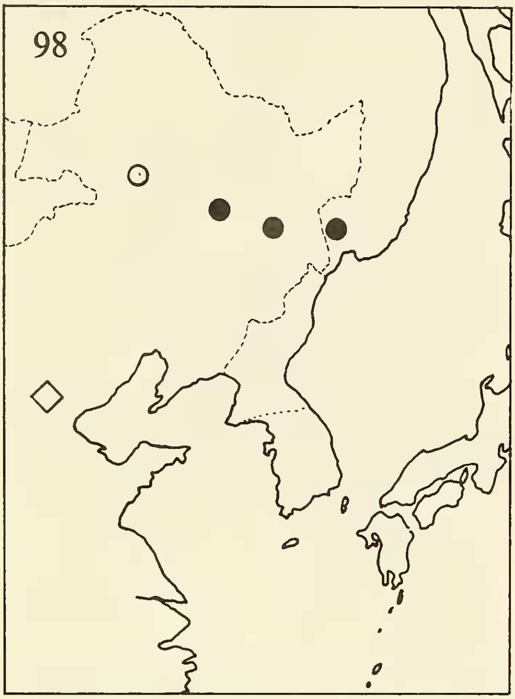
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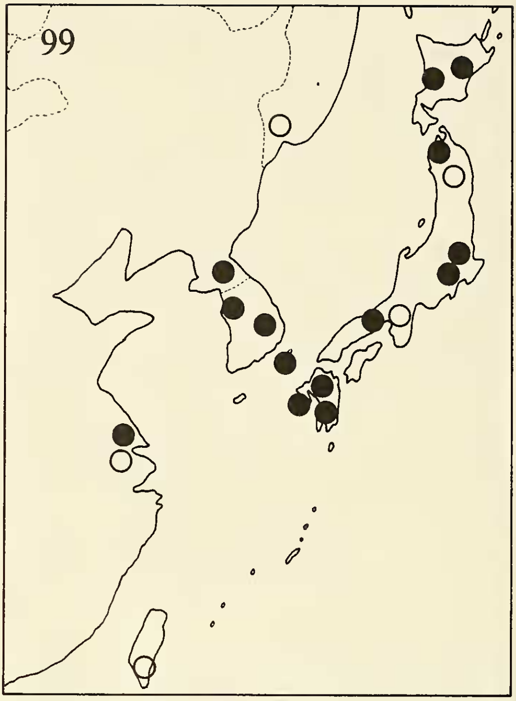
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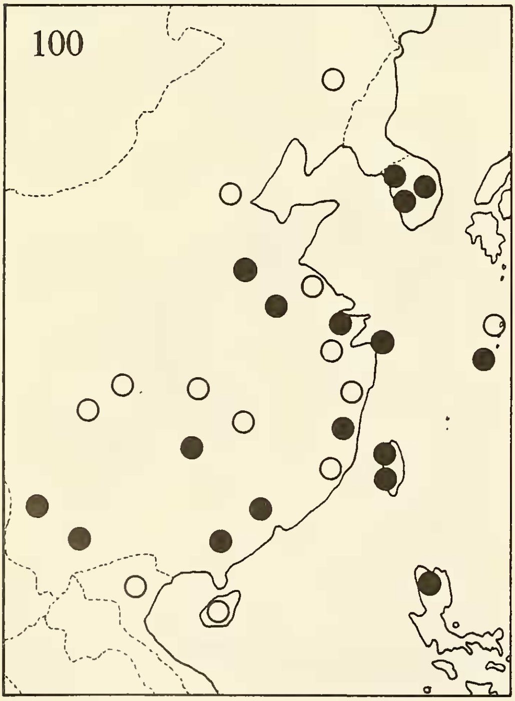
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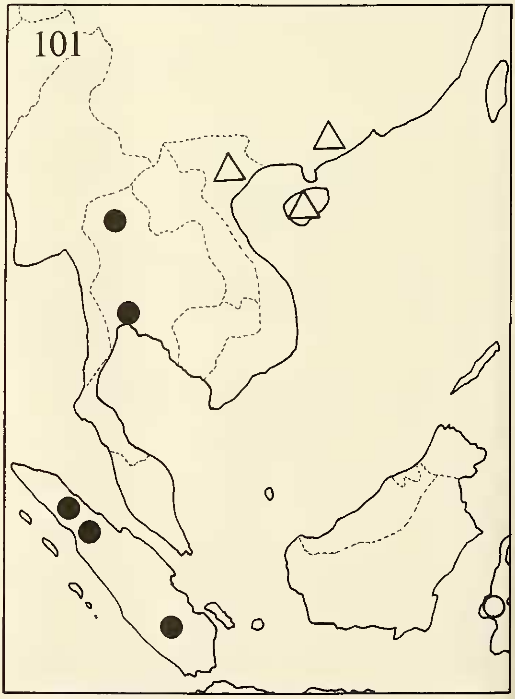
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Fig. 98. Distribution of *Peltodytes dauricus* (dots: examined; circle: literature record) and *Peltodytes pekinensis* (square)

Fig. 99. Distribution of *Peltodytes intermedius* (dots: examined; circles: literature records)

Fig. 100. Distribution of *Peltodytes sinensis* (dots: examined; circles: literature records)

Fig. 101. Distribution of *Peltodytes sumatrensis* (dots: examined; circle: literature record) and *Peltodytes coomani* (triangles)